



## Classification of the Leafbeetles from Korea Part IV. Subfamily Zeugophorinae (Coleoptera: Chrysomelidae)

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**Abstract** Leafbeetles of subfamily Zeugophorinae in Korea are revised. *Z. annulata* and *Z. bicolor* are known to the Korean peninsula until now. This subfamily is classified into only one genus, *Zeugophora* Kunze. Species of the genus are revised. Among them, *Zeugophora* (*Pedrillia*) *trisignata* sp. nov. is described as new to science. A key, external photos, geographical data and host plants to the three species of the genus, included description of new species, are provided.

**Key words** Taxonomy, *Zeugophora*, Fauna

### INTRODUCTION

Leafbeetles of subfamily Zeugophorinae in the world are classified into four genera, *Pedrilliomopha* Pic 1917, *Zeugophora* Kunze 1818, *Bruchomima* Achard 1916 and *Austrolema* Oke 1932. Members of *Zeugophora* in the world are divided into two subgenera, *Zeugophora* s. str. and *Pedrillia* Westwood 1864. Morphological characters of the former are as follows: frons with an impressed line between eyes posterior to fronto-clypeal suture; basal angle of prothorax simple without lateral projecting setae, and the latter are as follows: frons without an impressed line between eyes posterior to fronto-clypeal suture; basal angle of prothorax more or less tuberculate, with three laterally projected setae.

*Zeugophora* is so far known to occur in Holarctic and E. Africa, and *Pedrillia* in the Old World, E. Africa and Madagascar. This subfamily is generally considered as a small group as compared with other subfamilies of leafbeetles, e.g. nine species in Japan, twenty in China, eight in USSR and eight in the United States of America. Only the subgenus *Pedrillia* species of *Zeugophora* are reported in Korea until now, and this is also a small group, represented by three species of *Zeugophora*.

Body of this members covered with oblique pale hairs and not very flat. Antenna thick, and the side of prothorax strongly swelling anterior to constricted base. Each tarsal claw with appendix in internal side, and fore tibiae armed with single spur at apex. The species in Korea are generally less than 5 mm in body length.

Materials examined in this study included 133 adult specimens of *Zeugophora* species. Materials were based on the collections listed below.

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The provincial names in Korea for collected localities are abbreviated as follows: CB, Chungcheong-bugdo; CN, Chungcheong-namdo; GB, Gyeongsang-bugdo; GG, Gyeong-gido; GN, Gyeongsang-namdo; GW, Gangweondo; JB, Jeolla-bugdo; JN, Jeolla-namdo.

### Subfamily Zeugophorinae 흑가슴잎벌레아과

#### Key to Korean species of the genus *Zeugophora*

1. Elytron brown or pale testaceous with a black ring or black markings ..... 2  
     Elytron brownish testaceous without dark or pale mark; pronotum and legs black ..... *bicolor*
2. Elytron brownish testaceous with a postmedian black elliptical mark with white interior ..... *annulata*  
     Elytron pale testaceous with an oblique quadrangle black mark on basal portion, and with a large elliptical postmedian black mark ..... *trisinata*

#### Genus *Zeugophora* Kunze, 1818 흑가슴잎벌레속

*Zeugophora* Kunze, 1818: 71 (type-species: *Crioceris subspinosa* Fabricius, 1781)

#### Subgenus *Pedrillia* Westwood, 1864 흑가슴잎벌레붙이아속

*Pedrillia* Westwood, 1864: 280 (type-species: *Pedrillia longicornis* Westwood, 1864)

#### *Zeugophora* (*Pedrillia*) *annulata* (Baly, 1873) 흑가슴잎벌레

(Fig. 1)

*Pedrillia annulata* Baly, 1873, Trans. Ent. Soc. London, 1873: 79 (TL: Japan).

*Pedrillia biguttata* Kraatz, 1879, Deutsche Ent. Zeit, 23: 129 (TL: Amur).

*Pedrillia annulata* var. *disconotata* Pic, 1906, Echange, 23: 27 (TL: Japan).

*Zeugophora* (*Pedrillia*) *annulata*: Tomov, 1982, Ent. Rev. Japan, 37(1): 37

**Diagnosis.** Body length 3.5–4.5 mm. Body slightly convex, nearly 2.2 times as long as wide. Head reddish brown with brownish black mark on central portion of vertex; antenna 1–2 segments brownish testaceous, but following segments pitchy brown; prothorax brownish black with reddish brown anterior and posterior portions; elytron reddish brown or dark brown with a large sub-rotundate obscure fulvous patch behind middle, which is margined with black tinge in some case with a stripe running from base to posterior patch; legs brownish black. Pronotum without any transverse furrow at base, and almost as long as wide; disc strongly and evenly punctured. Body thinly clothed with oblique pale hairs with punctures.

**Materials examined.** GG: 1 ex., Gwangnung, 16 IV 1968 (SM Lee) (KPU); 1 ex., Gwangnung, 16 VIII 1981 (KJ Won) (NSM); 1 ex., Gwangnung, 24 VI 1989 (SL An) (NSM); 4 exs., Mt. Chugryong-san, 11 IV 1999 (SL An) (NSM); GW: 1 ex., Mt. Seorag-san, 27 VII 1982 (YJ Kwon) (NSM); 1 ex., Mt. Seorag-san, 24 VI 1986 (SM Lee) (NSM); 1 ex., Mt. Odae-san, 19 IV 1982 (YJ Kwon) (NSM); CB: 1 ex., Mt. Juheul-san, 6 VI 1983 (SM Lee) (KPU); CN: 8 exs., Mt. Gyeryong-san, 9 VII 1992 (SL An) (NSM); 1 exs., Mt. Gyeryong-san, 25 IV 1994 (SL An) (NSM); GB: 1 ex., Mt. Juwang-san, 26 VII 1993 (SL An) (NSM); 1 ex., Mt. Juwang-san, 28 VII 1984 (YJ Kwon) (NSM); 1 ex., Mt. Juwang-san, 11 VI 1984 (YJ Kwon) (NSM); 1 ex., Mt. Juwang-san, 26 VII 1984 (YJ Kwon) (KPU); 1 ex., Mt. Juwang-san, 27 VII 1984 (YJ Kwon) (KPU); 1 ex., Mt. Ga-san, 25 V 1986 (YJ Kwon) (NSM); 1 ex., Mt. Palgong-san, 29 IV 1982 (YJ Kwon) (NSM); 1 ex., Mt. Sobacksan, 14 VII 1997 (SL An) (NSM); 1 ex., Mt. Hwanghak-san, 28 VI 1982 (YJ Kwon) (KPU); GN: 1 ex., Mt. Jiri-san, 14 VII 1981 (YJ Kwon) (NSM); 1 ex., Mt. Jiri-san, 25 VI 1982 (SM Lee) (NSM); 2 exs., Mt.

Chirisan, 12 VIII 1988 (YJ Kwon) (NSM); 1 ex., Mt. Kŭmjŏngsan, 16 X 1983 (YJ Kwon) (NSM); JB, 2 exs., Mt. Naejang-san, 14 VIII 1981 (YJ Kwon) (NSM); JN: 1 ex., Mt. Daedun-san, 29 VI 1980 (YJ Kwon) (NSM).

*Distribution.* Korea (Central, South), Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (Manchuria), Russia (E. Siberia).

*Host plants.* *Celastrus orbiculatus* Thunberg, *Euonymus sieboldiana* Bl., *Euonymus alatus* (Thunb.) Sieb. (Kimoto and Takizawa, 1994), *Euonymus sachalinensis* (Fr. Schm) Max, *Phellodendron amurense* Rupr.

***Zeugophora (Pedrillia) bicolor* (Kraatz, 1879) 쌍무늬흑가슴잎벌레**

(Fig. 2)

*Pedrillia bicolor* Kraatz, 1879, Dtsche Ent. Zeit, 1897: 120, pl. 2, fig. 9 (TL: Amur).

*Pedrillia nigricollis* Jacoby, 1885, Proc. Zool. Soc. London, 1885: v195 (TL: Japan: Wada-toge).

*Zeugophora nigricollis*: Doi, 1927, Dob. Zassh. 39(466): 326

*Zeugophora (Pedrillia) nigricollis*: Gressitt and Kimoto, 1961, Pac. Ins. Mon. 1A:27.

*Zeugophora bicolor*: An and Kwon, 1995, Ins. Kor. Suppl. 5: 91-92.

*Diagnosis.* Body length 3.8-4.8 mm. Body slightly convex, nearly 2.0 times as long as wide. Head, antenna and legs black; prothorax black with reddish brown posterior portion; elytron yellowish brown. Pronotum wider than long with strong punctures. Body thinly clothed with oblique pale hairs with punctures.

*Materials examined.* GG: 2 exs., Mt. Hwak-san, 23 V 1978 (SM Lee) (NSM); 1 ex., Gwangnung, 13 V 1983 (KJ Won) (NSM); 1 ex., Weonjidong, Seoul, 1 VI 1985 (YY Lee) (NSM); 1 ex., Mt. Cheonggye-san, 5 V 1990 (SL An) (NSM); 6 exs., Mt. Bukhan-san, 11 VII 1976 (SM Lee) (KPU); 2 exs., Mt. Bukhan-san, 11 VII 1981 (SM Lee) (KPU); GW: 2 exs., Mt. Taebaek-san, 26 VI 1976 (SM Lee) (KPU); 1 ex., Mt. Gariwang-san, 27 V 1998 (SL An) (NSM); 3 exs., Mt. Duwi-bong, 10 VI 2000 (SL An) (NSM); CB: 19 exs., Mt. Songni-san, 6 V 2001 (SL An) (NSM); 3 exs., Suanbo, 18 V 2001 (SL An) (NSM); CN: 3 exs., Daejeon-shi, 4 V 1998 (SL An) (NSM); 13 exs., Mt. Geryong-san, 22 V 1992 (SL An) (NSM); 1 ex., Mt. Bomun-san, 1 VII 1992 (SL An) (NSM); GB: 2 exs., Mt. Hwanghak-san, 28 VI 1982 (YJ Kwon) (KPU); 8 exs., Mt. Gapjang-san, 1 VIII 2000 (SL An) (NSM); 2 exs., Mt. Palgong-san, 27 VI 1981 (YJ Kwon) (KPU); 1 ex., Seo-myon, 9 V 1997 (SL An) (NSM); 6 exs., Mt. Sobaek-san, 10 V 1985 (YJ Kwon) (KPU); 3 exs., Mt. Hwaak-san, 14 V 1998 (SL An) (NSM); 1 ex., Mt. Bibong-san, 14 V 1999 (YJ Kwon) (NSM); GN: 1 ex. Mt. Gaya-san, 6 VI 1996 (SL An) (NSM); 3 exs., Mt. Jiri-san, 27 V 1987 (SL An) (NSM); 1 ex., Mt. Weolryeong-san, 13 VI 1997 (SL An) (NSM); 2 exs., Mt. Goekwan-san, 13 VI 1997 (SL An) (NSM); 1 ex., Mt. Yeohang-san, 29 V 1999 (SL An) (NSM); JB: 1 ex., Mt. Hagil-san, 6 VI 1997 (YJ Kwon) (NSM); 2 exs., Mt. Sambong-san, 25 V 1997 (YJ Kwon) (NSM); 1 ex., Mt. Seonui-san, 26 V 1997 (YJ Kwon) (NSM); 1 ex., Mt. Deogyu-san, 26 V 1996 (SL An) (NSM); JN: 1 ex., Mt. Suryeon-san, 14 VI 1997 (SL An) (NSM); 1 ex., Mt. Baekun-san, 11 IX 1999 (SL An) (NSM).

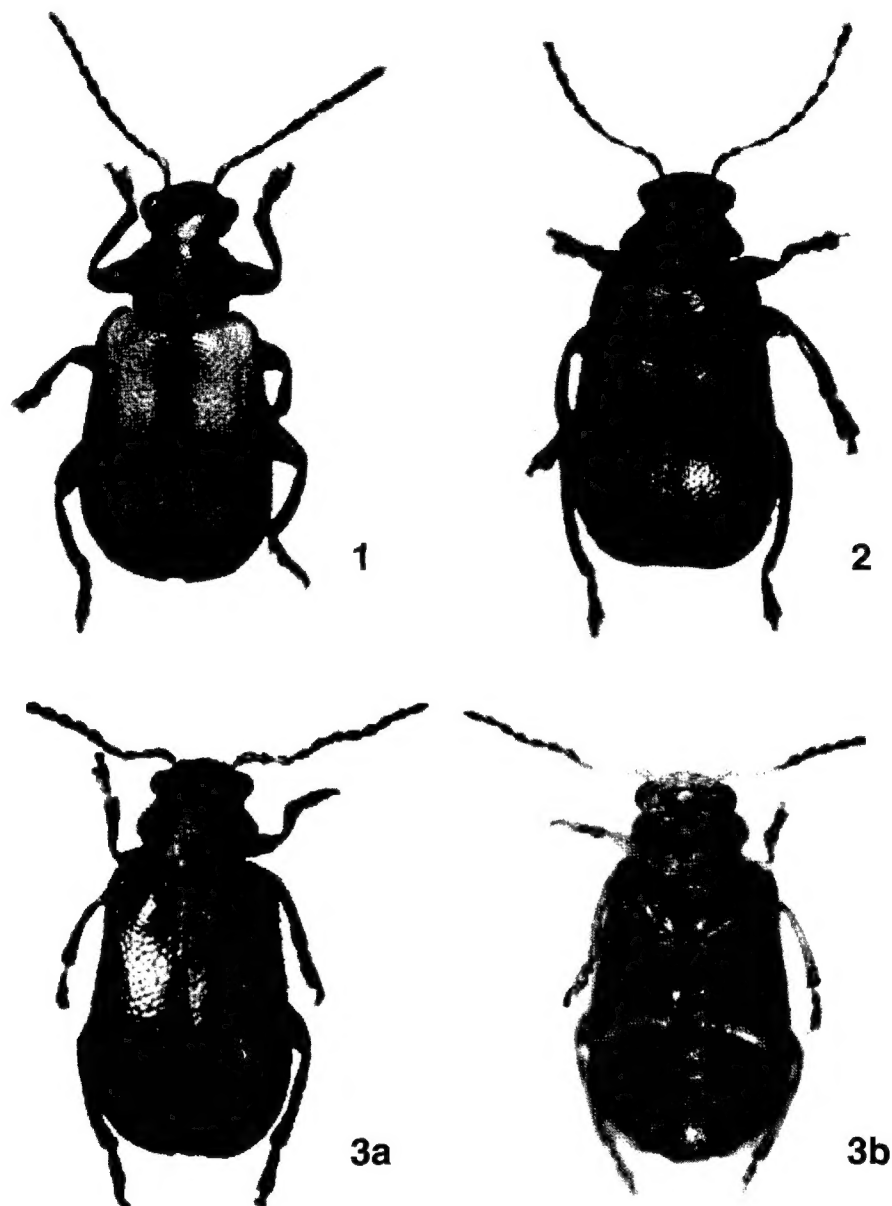
*Distribution.* Korea (Central, South), Japan (Hokkaido, Honshu, Shikoku, Kyushu), Russia (E. Siberia).

*Host plants.* *Euonymus sieboldiana* Bl., *Euonymus sachalinensis* (Fr. Schm) Max

***Zeugophora (Pedrillia) trisignata* An et Kwon, sp. nov. 세점흑가슴잎벌레 (신창)**

(Figs. 3a, b)

*Type Material.* Holotype: 1 ♀, near Weoljeongsa Temple, Mt. Odaesan, GW, Korea, 8 V 2000 (SL An).



**Figs. 1-3.** *Zeugophora* spp. Adults: 1. *Zeugophora (Pedrillia) annulata* Baly; 2. *Z. (Pedrillia) bicolor* Kraatz; 3a. *Zeugophora (Pedrillia) trisignata* sp. nov. holotype; 3b. ventral view of *Zeugophora (Pedrillia) trisignata* sp. nov.

*Paratype.* 1 ♀, the same data as holotype. The holotype and the paratype are deposited in the Entomological Laboratory of National Science Museum, Korea.

*Type Locality.* As given for holotype.

*Description.* General coloration pale testaceous with three large black marks on elytra; head

reddish brown with large black mark exception for reddish brown anteriorly on about 1/2 median portion; mouth parts reddish brown; antenna brownish testaceous, but apical portion of 4th and following segments pitchy brown; prothorax reddish brown; scutellum reddish brown; elytron pale testaceous with a oblique quadrangle black mark on basal portion and a large elliptical postmedian black mark, the former extending obliquely backward from side near humerus to 1/3 area of suture, and reaching suture, the latter also extending obliquely backward fused external elytral margin pitchy but not reaching suture; external elytral margin pitchy just before apex; ventral surfaces reddish brown except for meso and metathroax black; legs ochraceous brown. Body thinly clothed with oblique pale hairs, which are shorter on antenna, and closer on ventral surface and legs, being denser on tibiae.

Head slightly narrower than prothorax, breadth slightly longer than length; clypeus slantly truncated apically, with strong and long setae in basal portion; vertex flat, broader than width of an eye, evenly and regularly punctured. Antenna nearly 1/2 as long as body, slender; scape 4 times as long as broad, fairly swollen apically; pedicel about 1/2 as long as scape; 3rd segment 2/3 as long as 1; 4 nearly as long as 3; 5–10 short and stouter, subequal, each 2/3 as long as 5; 11 slightly longer than 10, acute apically. Prothorax about 7/10 as long as broad, about as wide as apex as at base, but broadly expanded in anterior 2/3, the expansion gradually widened to about middle of side, then suddenly narrowed; side further narrowed to base behind expansion; disc evenly convex, closely and deeply punctured, the punctures more wide than interspaces. Scutellum abruptly narrowed backwards at middle, slantly round behind; surface strongly punctured. Elytron about 3 times as long as broad, slightly widened to behind middle, broadly rounded apically; disc evenly convex, strongly and irregularly punctured, the punctures more wide than interspaces on anterior 1/2, but narrower than interspaces on posterior. Ventral surfaces generally punctured, this punctures more weakly and sparsely than those of elytron, but more strongly and densely on metasternum and metepisternum. Legs stout; femora enlarged, hind femur most swollen; tibiae slightly curved ventrally; hind tarsal 1st segment slightly longer than 2nd. Body length in female 4 mm; breadth 2 mm.

*Diagnosis.* The new species resembles *Z. flavonotata* (Chuzo) from Ryukyu Is., Japan, but differs from the latter by its longer body (4 mm), head with large black mark, different elytron color and shape, mesothorax black, and legs ochraceous brown.

*Distribution.* Korea (Mt. Odaesan). This species is only known at the type locality.

*Etymology.* The specific name is derived from three black marks on elytra.

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(Received: July 10, 2002, Accepted: August 20, 2002)